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19. (new) A method for determining binding of a species at a surface having a local environment at a given pH or surface potential, wherein said binding is effective to alter said pH or potential, the method comprising:

stably incorporating at said surface a probe which comprises a pH- or potential-sensitive fluorophore attached to a steroid, to a head group of a sphingolipid or to a head group of a lipid having at least two chains, each chain comprising at least 14 carbon atoms in length, and wherein each independently said chain is selected from the group consisting of acyl, alkyl or alkenyl, and

observing a change in a fluorescent property of said fluorophore upon binding or dissociation of said species at said surface.

20. (new) The method of claim 19, wherein said surface is the surface of a lipid bilayer.

21. (new) The method of claim 19, wherein said fluorophore is selected from the group consisting of a pH-sensitive lissamine rhodamine compound, 7-hydroxycoumarin, fluorescein, and pH- or potential-sensitive derivatives thereof.

22. (new) The method of claim 19, wherein said lipid is a phospholipid.

23. (new) The method of claim 21, wherein said phospholipid is a diacyl, dialkyl or dialkenyl phosphatidyl ethanolamine or ceramide phosphoethanolamine.

24. (new) The method of claim 23, consisting of 7-hydroxycoumarin conjugated via a 3-carboxamide linkage to the head group nitrogen of a diacyl, dialkyl, or dialkenyl phosphatidyl ethanolamine, or ceramide phosphoethanolamine.

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cont
25. (new) The method of claim 19, wherein said species is a biomolecule having groups which are positively or negatively charged at a selected pH between about 2.0 and 12.0.

26. (new) The method of claim 25, wherein said groups are positively or negatively charged at a selected pH between about 4.5 and 7.5.

27. (new) The method of claim 25, wherein said biomolecule is a nucleic acid.

28. (new) The method of claim 25, wherein said biomolecule is a protein comprising amino acids with acidic or basic side groups.

29. (new) The method of claim 19, wherein said surface comprises groups which are positively or negatively charged at a selected pH between about 2.0 and 12.0

30. (new) The method of claim 29, wherein said groups are positively or negatively charged at a selected pH between about 4.5 and 7.5.

31. (new) The method of claim 20, wherein said lipid bilayer comprises a lipid having a cationic head group.

32. (new) The method of claim 19, wherein, upon said incorporating, said fluorophore is separated from said surface by a distance equal to or less than 15 nm.

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Cont 33. (new) The method of claim 19, wherein said lipid or steroid is attached to two or more fluorophores.

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C2 34. (new) A method for determining binding of a species at a polymer surface having a local environment at a given pH or surface potential, wherein said binding is effective to alter said pH or potential, the method comprising:

stably incorporating at said polymer surface a pH- or potential-sensitive fluorophore, and

observing a change in a fluorescent property of said fluorophore upon binding or dissociation of said species at said surface.

35. (new) The method of claim 34, wherein said fluorophore is covalently bound to said polymer.

36. (new) A method for determining binding of a species at a surface having a local environment at a given pH or surface potential, wherein said binding is effective to alter said pH or potential, the method comprising:

stably incorporating at said surface a probe which comprises a pH- or potential-sensitive fluorophore attached to a steroid, to a head group of a sphingolipid or to a head group of a lipid having at least two hydrophobic chains, each said chain comprising at least 14 carbon atoms in length, and

observing a change in a fluorescent property of said fluorophore upon binding or dissociation of said species at said surface.

REMARKS

The Official Action of April 18, 2002, and the prior art relied upon therein have been carefully reviewed. The claims in the application are now claims 19-36, and these claims define patentable subject matter warranting their allowance. Applicants accordingly respectfully request favorable reconsideration and allowance.

Acknowledgement by the PTO of applicants' claim for domestic priority is acknowledged.

The non-elected claims have now been deleted without prejudice to applicants' rights.